



Field Scouting Protocols for Sunflower Pests, 2010

Goals: There are two major goals for these protocols:

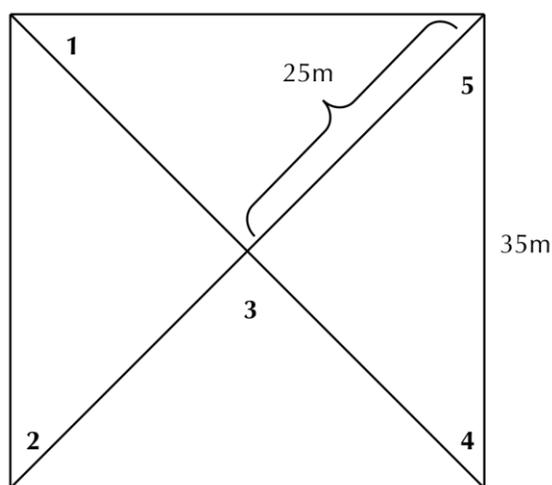
- To get a good sense of which insect pests are present in sunflower fields across Vermont, of when their life stages occur, and of their typical populations.
- To gain an understanding of where economic thresholds lie for significant pests, and establish a rough idea of the pests' life history and potential populations based on our observations.

Procedure: The following procedures for monitoring adult populations of Sunflower Receptacle Maggot (*Gymnocarena diffusa*), Sunflower Stem Maggot (*Strauzia longipennis*), and Sunflower Seed Maggot (*Neotephritis finalis*) will be used at State Line Farm in North Bennington and at the Scott farm in Newbury; field arrangement at the Borderview Farm doesn't allow use of the same technique.

Set Up: Select two random locations in the field, at least 75 feet (23m) from the field edge. For each location, hang five ammonium-baited yellow sticky traps on wire hangers in an X pattern, with each corner spaced from the others 35 meters (115 ft.), and the middle card placed where the diagonals cross. It is important to get the traps into the field as soon after planting as is feasible, no later than June 1.

Data Collection – Adults: Every other week (preferably on the same day) for eighteen weeks (9 sampling dates), collect traps, wrap them in Saran wrap, and identify and count the insects of each species.

Be sure to mark the date, the trap number, the species collected, and the number of each species. This is most important for the three sunflower maggot species that we're concerned with, but identifying the others on the trap will be helpful when possible. The data might look like the following:



35m
35m
Sampling area layout

Date: 08/01/10	Trap #: T2-A
Species Collected:	# of Individuals:
<i>S. longipennis</i>	16
<i>N. finalis</i>	2
Coleoptera sp.	1
Diptera sp.	15

Be sure to note anything worth mentioning in the notes section. Examples might include general weather over the past week, condition of the trap at the collection time, problems with the protocol, etc. etc. Also note and describe any photos taken.

Data Collection – Larvae: This protocol uses the same X-pattern sampling design as the sticky traps, also on two-week intervals. Select a random starting location in the field (a new location will be chosen every sampling period), and choose the 4 closest plants. Inspect the stems and heads for signs of damage and presence of eggs or larvae. Note the type and extent of damage, and attribute it to a species if possible (following the NDSU pest identification guide). Again, note date, and survey location (replicate and point location – e.g. S1A). The data might look like this:

Date: 8/1/10	Survey Location: S1A-1					
Type of Damage:	Extent of Damage:				Eggs present? (Species?)	Larvae present? (Species?)
Larvae exit holes	14	9	29	2	No	Yes (<i>S. longipennis</i>)
Damaged florets	19%	9%	29%	40%	Yes sp. unknown.	No.

Note that we'll try to keep the data for each plant separate in the "extent of damage" column, only to make data collection more time efficient. Those results will get averaged later. To get to the next station, pace 35 meters along the row, and sample the four closest plants again. To get to the middle, pace 25 meters along the diagonal.

Similar information in the notes sections of these data sheets will also be helpful. Note any damage to the plant that does not seem to be insect caused, any response by the plants to the presence of insects, or anything else interesting. As above, noting what pictures were taken and describing what the picture is of will be helpful.

Analysis: Philip will do this in the fall. The goal is to be able to calculate population of adults per trap per week, which will give us a picture of the relative populations at various

locations. The big hope is that we'll be able to relate populations of the adults to the populations of larvae that we see and the damage that they create, which will ultimately allow us to predict damage from populations of adults we see early in the season.

Insects to Expect (that are known to be pests):

Flies (Diptera: Tephritidae):

Sunflower Seed Maggot (*Neotephritis finalis*)

Sunflower Receptacle Maggot (*Gymnocarena diffusa*)

Sunflower Stem Maggot (*Strauzia longipennis*)

Moths (Lepidoptera):

Sunflower Bud Moth (*Suleima helianthana*)

Banded Sunflower Moth (*Cochylis hospes*)

Sunflower Moth (*Homoeosoma electellum*)

Beetles (Coleoptera):

Sunflower beetle (*Zygogramma exclamationis*)

Pale-stripped flea beetle (*Systema blanda*)

Weevils (Coleoptera: Curculionidae/Attelabidae):

Red Sunflower Seed Weevil (*Smicronyx fulvus*)